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ABSTRACT

This paper discusses the contribution of Nathan B. Stubblefield of Murray (Calloway County), Kentucky, to the field of broadcast history and ascribes to him the invention of wireless voice communication. In 1888, Stubblefield was granted a patent on a mechanical or "knocking" telephone which was subsequently installed in towns in several states including Kentucky, Indiana, Mississippi, and North Carolina, However, by 1889, the Bell telephone, an electrical device far superior in sound quality and distance, had worked its way westward into Stubblefield's home territory, and soon resulted in reducing the Stubblefield phone to intercom use. In 1908, Stubblefield patented a second kind of wireless telephone--a system based on induction--and one that is used by many to credit him with the invention of modern radio broadcasting. However, Stubblefield's attempts to market his wireless telephone were unsuccessful and soon other devices surpassed his inventions. Biographic information about Stubblefield is included. (LL)

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OVERHEARD BUT OVERLOOKED

The Story of Nathan B. Stubblefield

Pioneer Wireless Experimenter

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CS 501 394

Radio is the child of many fathers; at least, so history at the dawn of 1976 suggests. Many historians attribute its invention to Guglielmo Marconi, an Italian working on British soil, who first successfully demonstrated wireless telegraphy in 1896; others assign the honor to R.A. Fessenden, a Canadian, who on Christmas Eve of 1906 sent music and voice signals through the ether from Brant Rock, Massachusetts, which were picked up by some very surprised wireless operators at sea. Lee DeForest, inventor of the AUDION tube (1907) accepts the responsibility all by himself, entitling his autobiography The Father of Radio. And, not to be outdone, the Russians claim the honor for their native son, Alexander Popov, maintaining that his experiments in the early part of 1896 antedate those of Marconi.

The list goes on and on. Fleming, who added the "Fleming valve" to the vacuum tube, Dr. Frank Conrad of the Westinghouse Corporation who put station KDKA on the air in Pittsburg in 1920, Dr. Mahlon Loomis, a Virginia dentist who is reputed to have been sending wireless telegraphic messages between mountaintops in the Blue Ridge chain as early as 1866, and so on and on. Although the number and accomplishments of these gentlemen is more than sufficient to keep broadcast historians busy for some time to come, another name has recently begun to emerge from the annals of recorded history, a name that is demanding attention by today's broadcast historians; Nathan B. Stubblefield of Calloway County, Murray, Kentucky.

At this point in time references to the work of Stubblefield are scattered and for the most part vague and often inaccurate. Eric Barnow in his definitive history of broadcasting refers to Stubblefield as a "mysterious figure" who "is said to have transmitted voice as early as 1892." George O. Gillingham wrote in Steinberg's 1966 publication, Mass Media and Communication that Stubblefield may have "first claim" to the distinction of voice broadcasting. The Encyclopedia Americana notes in its entry on Murray, Kentucky that the experiments of Stubblefield "are said to have antedated Guglielmo Marconi," and the current Broadcasting Yearbook's "Primer" on radio history states that Nathan Stubblefield might have been the first to make successful wireless voice transmissions. Even TV GUIDE magazine carried a story in October of 1970 on Bernard Stubblefield, oldest son of Nathan B. Stubblefield, heralding him as "the world's first broadcaster."

So who was Nathan B. Stubblefield? What exactly did he invent and assuming that his device did indeed broadcast the human voice as much as four years prior to Marconi's wireless telegraphy, why have his name and his work remained buried in broadcast history?

One who seeks answers to the above questions is in for no easy time of it. Records of his life following the early breakup of his family -- his father died in 1874, when Nathan was fourteen -- are spotty at best, and there are many gaps that can be filled only by the recollections of those few individuals who knew him during the lonely autumn years of his life. Too,

Stubblefield was himself a secretive and suspicious man who was as much a curiosity to those who knew him during his lifetime as he is today, and consequently there are intervals throughout his life where no reliable information is available concerning his whereabouts and activities; even the exact date of his birth is uncertain since the official records in the Calloway County Courthouse were destroyed in a fire that burned that structure to the ground in 1880. It's certain that Stubblefield was born in 1860, the third son of William Jefferson Stubblefield, who, shortly after Nathan's birth, became a captain in the Army of the Confederacy. His mother was Victoria Frances Bowman, and many sources record her last name as the middle name of her third son; in fact, the historical marker on the outskirts of Murray, Kentucky which announces to all who pass that way that they are now entering "The Birthplace of Radio," records his name as being "Nathan Bowman Stubblefield." Captain Stubblefield, however, records his son's name as Nathan Beverly, after Nathan's paternal grandfather, Colonel Beverly B. Stubblefield, and so refers to him in his last will and testament. Nathan himself sheds no light whatsoever on the matter, for throughout his life he always signed himself "Nathan B. Stubblefield," a habit perhaps developed in his early years to keep peace in the family.

Stubblefield had no interest in picking up his father's post-war law practice, but instead directed his attention to the study of electricity and of its possible uses in communication.

He and Duncan Holt, a boyhood friend, were frequently to be found in the office of W.O. Wear, editor of the Calloway County Times, for Mr. Wear subscribed to several magazines, among which was Scientific American through whose articles the boys could keep up with the latest developments and discoveries in the field. During these years, Stubblefield was attending boarding school at Farmington, Kentucky, a small community some twelve miles west of Murray, where he met and courted Ada Mae Buchanan, the great-grand niece of President James Buchanan. The couple married in 1881 and Stubblefield's formal education ended (at about the eighth grade level) and his life as a husband, father, and inventor began.

Nine children were born of this marriage, six of whom lived to adulthood, and all of whom feared their father. He was a strange and difficult man, who never allowed them to bring playmates home with them to play on the 85 acre farm on which they lived. Nor did he allow his children to attend public school or even church for fear that one of them would inadvertantly mention something of his experiments and inadvertantly give away some of his secrets. So he educated them at home, giving them articles to read from the scientific journals he was able to secure.

All of the family worked the small farm, raising truck vegetables and apples and peaches. They were anything but prosperous, and most of the time had just enough food to keep them going and very little to wear. And whether the crop was fat or lean, any monies derived from its sales that were not

needed for bare existence by the family went into materials for Stubblefield's electrical experiments. Stubblefield was, in fact, very close to being the stereotyped mad inventor, nearly oblivious to all around him save for his ideas, experiments, and dreams of great success.

It is not surprising in view of the above that the children left home as soon as they possibly could. And the three oldest children, who by a curious set of circumstances having to do with Nathan's spending all his money for experiments actually owned the 85 acre farm, not only left home, but sold the farm out from under their father when they did so, leaving Stubblefield and his wife and the reamining children without a place to live. When in 1917 the last child, a daughter, married and left home, Stubblefield's wife also left, returning to the home of her parents and leaving Stubblefield, by then a 57 year old man, very much alone.

Despite his domestic problems Stubblefield doggedly pursued his interest in electricity and invention. In 1885 he obtained a patent for the Stubblefield Lighting Device "a new and useful improvement in Coal-Oil Lamp Lighters" according to his description, which enabled its user to light lamps which have glass chimneys "without the removal of the latter." This first patented invention of Stubblefield's never got beyond the Patent Office; like the majority of all things patented in the United States, it was never picked up by a manufacturing firm and put on the market.

Stubblefield's second patented invention, the mechanical

telephone (also called a "knocking" or "vibrating" telephone), enjoyed a much different fate; it set Nathan Stubblefield up in the telephone business and paved the way for his future experiments with wireless telephony. The telephone was actually a simple device that transmitted sound in much the same way as two tin cans that are connected by a taut string. When one spoke into one of the units, the sound waves generated by his voice travelled along the wires connecting the unit spoken into with sister units and were reproduced at the receiving end by a unit that was exactly the same as the one originating the signal. The device looked and operated very much like a modern speaker cone, and within a year Stubblefield had installed them in many homes in and around Murray. He later improved the device by adding a speaking tube and was granted a patent on what he renamed the "Laryngophone" in 1888.

Research shows that Stubblefield's Laryngophone met with some success and were installed in towns in several states including Indiana, Mississippi, and North Carolina. In his home state of Kentucky he successfully marketed his system in numerous towns and received much favorable mention in local newspapers for his wonderful invention. But success was short-lived. By 1889 the Bell telephone, an electrical device far superior in sound quality and distance, had worked its way westward into Stubblefield's home territory, and soon his telephones were reduced to little more tha intercom status, being used by people to communicate from the house to the barn or from the store to the home nearby.

Discouraged, but realizing he had been bested, Stubblefield adopted an "If you can't beat 'em, join 'em!" attitude and set about to assemble an electrical telephone system in Murray. In March of 1894 he brought in a system manufactured by the Viaduct Manufacturing Company and attempted to organize a local company to finance the operation which he would oversee. But his strange nature and his basic distrust of his fellow man proved his downfall and the telephone exchange he envisioned installing never came about. In later years he was to write on the back of the abortive corporate agreement he had drawn up:

> The failure of this exchange was due to the all around cussedness of a few of the parties whose names appear. The only revenge I have ever been able to obtain for this wrong treatment (which I will say was in quite a measure due to ignorance and doubt as to my ability) was to afterwards to get the town to grant me a charter . . . nonetheless I brought the first electric telephones to Murray and taught the people which end . . . .

Here the words are illegible, but the meaning is quite explicit. On the face side of the agreement, down in the lower left hand corner beside the names of the subscribers, Stubblefield printed in heavy black letters: "MAN'S INHUMANITY TO MAN MAKES COUNTLESS MILLIONS MOURN."

Stubblefield eventually gave up the electric telephone business in disgust, and also abandoned his mechanical telephone system. But the whole experience was not without benefit. Not only had it gotten Stubblefield interested in telephony and provided him with the only good business venture he was ever to know, but it also gave him the idea and the determination to assemble the device that he thought would best the invention

that had bested him; the device that was to buy him a glimpse of immortality: the wireless telephone.

It is difficult if not impossible to attach an accurate date to the time when Nathan Stubblefield first began to work with the idea of a wireless telephone. In an article in the St. Louis Post Dispatch dated Sunday morning, January 12, 1902, which bore the headline "Kentucky Farmer Invents Wireless Telephone," Stubblefield is quoted as having said:

> I have been working for this ten or twelve years. . . long before I heard of Marconi's efforts or the efforts of others to solve the problem of the transmission of messages through space without wires . . . This solution is not the result of an inspiration or the work of a minute. It is the climax of the labor of years of days and nights of thought, of hundreds of hours of experimenting.

Edward Freeman, in recent times editor of the Nashville Tennessean and one-time editor of the Murray Ledger and Times, wrote a feature article in the latter paper in May of 1938 in which he recounted an interview with Duncan Holt, Stubblefield's boyhood friend. In that article is more evidence that Stubblefield had been working on his wireless telephone for many years before he displayed it to the public. Wrote Freeman:

> One Sunday that year (1885) Stubblefield invited Holt and his wife out to his home . . . That afternoon he said to Holt: "Duncan, I've done it! I've been able to talk without wires . . . all of 200 yards . . . and it'll work everywhere." At that time, Holt said, the Scientific American had never mentioned the possibility in suggestion or otherwise that speech or intelligent communication could be transmitted without wires. Stubblefield was the first to entertain the idea.

From such references it is safe to assume that Stubblefield had been working on his wireless telephone for around twenty years prior to receiving a patent on it in 1908.

The road between Stubblefield's first inventing of his wireless telephone and its patenting was a long and rocky one. Over the twenty year period he made numerous demonstrations to sell his device to potential stockholders, and stories and pictures of these demonstrations abound in newspapers of the time. Also during these two decades a company was formed around Stubblefield's invention, The Wireless Telephone Company of America, but it died before it ever really got started. These years were a continuing struggle for Stubblefield, first to secure the necessary financial backing to continue work on his device, and second to convince the United States Patent Office of the uniqueness of his invention.

When compared to the highly sophisticated radio communications devices of modern times, Stubblefield's wireless telephone seems amazingly simple in its concept and operation. His first wireless phones, those with which he worked prior to 1903, were based upon the principle of ground radiation. That is, Stubblefield generated an electromagnetic current by hooking a carbon mike from a Bell telephone in series with a storage battery that he had invented and later patented in 1898. He then took the output of the battery and fed it into the earth by connecting the output wires to steel rods which were rammed into the earth when one desired to begin transmission or reception of a telephone message. The earth, an elastic medium, then became the medium of transmission; it carried the electromagnetic waves as generated by Stubblefield's device to its sister units that were themselves connected to the ground. The system here described was capable of sending messages a distance of about one mile, according to the recollection of

Bernard Stubblefield, oldest son of Nathan Stubblefield and the only man ever to work with Stubblefield in his experiments.

It was this system involving the principle of ground radiation that Stubblefield used in his first demonstrations of wireless telephony in Murray in 1892 with Dr. Rainey T. Wells, who was many years later in 1947 to testify before an FCC hearing as to the truth of the Stubblefield story; it was this same system that he used to make his widely-publicized demonstrations in Washington, Philadelphia, and New York ten years later in 1902. But Stubblefield had always felt that his system was not earth-bound, "My medium is everywhere," he often was quoted as saying and in 1903 he succeeded in severing the ties that had held his system to the earth, and he began a second kind of wireless telephony. It was this second system that he was later to go on to patent in 1908, a system based on induction and the one that is used by many to credit him with the invention of modern radio broadcasting.

Briefly, this second system worked as follows: Stubblefield retained the carbon (telephone) microphone and the battery from his original system, but he discarded the ground rods and substituted in their place a coil of copper wire. He then connected the microphone and the battery and the coil in series and succeeded in generating an electromagnetic audio wave which was transmitted through the atmosphere. The waves he generated were enough to induce current in sister units, and his system was complete. In brief, what he had was a primary (transmitting) coil and a secondary (receiving) coil; by means of a switch built into the telephones, he could reverse the functions of each of his units from that of sending to receiving. Thus two way

communication was possible.

According to son Bernard, who accomplanied his father to Washington and other cities in 1902 and who took part in all the demonstrations, the system was capable of transmitting and sending messages a little over a mile. In theory and in Stubblefield's mind, the system could carry messages much further, but its practicality was severely limited because the distance of transmission was dependent on the size of the transmitting coil; the larger the coil, the farther the system could carry. But the coil soon became outlandishly large and impossible to use, and thus the system had a built-in handicap from the start. Stubblefield was aware of the problem and in 1908 constructed in his front yard a coil some forty feet high in an unsuccessful attempt to stretch the distance spanned by his signals.

Aware of the problems and limitations, Stubblefield nonetheless sought to obtain a patent for his system. He engaged the services of one E.G. Siggers, a Washington patent attourney and was constantly scratching to come up with the money to keep Siggers on the job. In truth, as one reads through Stubblefield's personal diary recounting these years of struggle, it was really Stubblefield himself who finally emerged victorious, receiving word in October of 1907 that his claims were considered valid by the Patent Office and he would indeed be issued a patent on his device; Siggers' role seems to have been mainly one of telling Stubblefield what he could NOT do and attempting in general to dissuade Stubblefield from the patent endeavor.

With patent 887357 in hand, Stubblefield sought to organize a local company in Murray to manufacture and market his device.

He had travelled this road six years earlier in 1902 at the insistance of a man by the name of Gerald M. Fennell, a New York promoter who had read of Stubblefield's work in the newspapers and journeyed from New York to Kentucky to talk with the inventor. The company organized by Fennell, the Wireless Telephone Company of America, was officially chartered under the laws of the territory of Arizona, probably because there were no strict requirements for organizing a business there in 1902; Arizona did not even become a state until 1912. Fennell set about assembling a board of directors of such prominent businessmen as he could interest in the idea at the time and soon was grinding out promotion of all sorts about Stubblefield and his wireless telephone, much of which, while not downright false, greatly stretched the truth. For whatever else he was or wasn't Nathan Stubblefield was strictly an honest man and he disliked intensely Fennell and his promotional schemes. When Fennell went so far as to suggest that Bernard and the elder Stubblefield sneak out to the demonstration sight the night before the demonstrations and bury a cable in the earth with which to connect the transmitting and receiving devices and thus improve the quality of reception, Stubblefield immediately and publicly denounced the company and Fennell and disassociated himself from it, abandoned any further demonstrations in the east and returned home to Murray. It was this past experience that led him, once he had his patent, to decide to work only with homefolks, that is, if he could.

But here again his efforts were to bear no fruit. By now others were making wireless voice transmissions and again, as

was the case with his mechanical telephone vs. the electrical telephone, the devices of others seemed to go farther and perform better than Stubblefield's. By August 24, 1908, Stubblefield had found no real financial backing for his business enterprise and no furthur record of any attempts along this line are to be found.

And so, fresh from the hard-won victory of the patent, he again met defeat in his attempts for financial success and personal recognition. He withdrew from the world of patents and business and business associates and returned to his farm and his family, both of which, like his dreams of wealth and fame from his inventions, he was soon to lose.

After the dissolution of his family in 1917 Stubblefield, now a lonely and bitter pauper, moved from place to place in and around Murray and Calloway County, wherever he could find work enough to eke out an existance and to pay for the parts for the devices he continued to invent and build. Although he was doubtless aware of the dawn of modern radio with the advent of KDKA and the flood of radio broadcasting stations that followed it, he never recorded his reactions in his papers. Near his sixtieth birthday he wrote to the U.S. Department of Agriculture in search of work, describing himself as "not in any way dissipated. I can do most anything I could get to do -- keep books, doing writing or experimental work . . ." The answer from Uncle Sam was polite and friendly in tone and informed Stubblefield that he would have to take the Civil Service examinations, for which the department doubted his scanty education would have prepared him.

In 1923 Stubblefield was living out in the county in a

make-shift shack he had erected between four trees he found growing in an almost perfect square. He was befriended by a nearby farmer, Carl Crisp, who persuaded him to take up residence in an old buggy barn on Crisp's property, in return for which Stubblefield would perform varying chores on the Crisp farm. Once in the barn, Stubblefield resumed the electrical experiments that, in reality, he had never abandoned, and Crisp today recalls the time when he heard Stubblefield's voice come to him "from out of the air" telling him that his cows had broken out of their pasture and were into Crisp's new corn. Crisp remembers vividly thinking that he must have been hearing things, but knew Stubblefield well enough to check things out. Investigation revealed that his cows were indeed as Stubblefield had said, and thereafter Carl Crisp had the utmost respect for the ability of the strange and eccentric man he had befriended.

In March of 1928 Crisp and some of his neighbors remarked to one another that none of them had seen any smoke coming from Stubblefield's barn and decided to investigate. They walked over to the barn and peered through a crack in the boards and saw Stubblefield lying on the floor, obviously dead. On the last day of March, 1928, the remains of Nathan B. Stubblefield were taken out to Bowman Cemetery two miles north of Murray to be buried near his father and mother. By some strange circumstance which nobody involved seems to be able to explain, Stubblefield was not buried inside the iron fence that Captain W.J. Stubblefield had had erected to surround the members of his family; rather Nathan

was buried well outside the fence in a grave that was for years marked only with an iron rod. Not one of his children or his wife attended his funeral.

In 1930, two years after Stubblefield's death, a young teacher at Murray State Teacher's College, who was also the secretary of the Murray Chamber of Commerce, L.J. Hortin, began the move to get Stubblefield recognized as the Father of Radio Broadcasting. Hortin had his journalism class assemble such facts and pictures as could be found and sent a feature story to the St. Louis Post Dispatch, the one large circulation newspaper that followed Stubblefield's efforts throughout his life. The Post Dispatch, as it had in 1902 when a reporter from that paper had come to Murray and interviewed Stubblefield and witnessed his device in action, printed a full page feature about Murray's eccentric inventor and thus began the recognition attempts that are still to be found today.

But is Nathan B. Stubblefield, after all, the father of radio broadcasting if indeed one man can be so labelled? Not really. His system utilized waves that are far below the frequencies utilized today for modern radio broadcasting. Too, Stubblefield began with an induction system and remained with it; Marconi, who is most generally credited with the invention and development of radio, also began with an induction system in his successful experiments with wireless telegraphy in 1895, but realizing the limitations of the system moved on to other methods until he and others such as Fessenden eventually emerged with the system of broadcasting that is used today. Also, Stubblefield's system utilized an intermittant wave that was present only when one spoke

into the microphone. Modern radio broadcasting is based on the process of modulating a signal upon a continuous high frequency carrier wave, a wave whose propagation was unknown to Stubblefield.

And finally, no one ever built on the Stubblefield system. It remained an inferior form of broadcasting from the time of Stubblefield's patent up to the present day, although today a form of his original ground system the one which, ironically, he discarded is being used to communicate privately between the underground defense installations that protect our nation.

So where does Stubblefield fit into broadcast history? It is entirely justifiable and correct to call him the inventor of wireless voice communication for my research of the last eight years indicates that he was, in fact, the first man to send and receive the human voice by wireless. Just as Heinrich Hertz had taken the ideas of James Maxwell and had built a device that would generate and receive the waves that Maxwell had theorized existed, Stubblefield took the idea of induction and built a device that would send and receive the human voice. Others had theorized that it could be done, but Stubblefield did it. The fact that Stubblefield successfully carried out his demonstrations with wireless voice four years before Marconi made his transmissions with wireless telegraphy is also very significant. And since Stubblefield's work was widely known during his active years, his work undoubtedly gave birth to the ideas of others such as Fessenden and proved to them that wireless voice communication was, indeed, quite possible.

Therefore, let the name of Nathan B. Stubblefield be recorded with the other pioneers of radio broadcasting, for, so far as is known in this bicentennial year, his voice along with the voice and harmonica music of his son, Bernard, were the first ever given electronic wings by mankind.